NAME: DATE:

Unit-2 Mastery Assessment (version 616)

Question 1 (10 points)

Let f represent a function. If $f[13] = 21$, then there exists a knowable solution to the equation below.

$$y = \frac{f\left[\frac{x}{2} - 10\right] + 24}{5}$$

Find the solution.

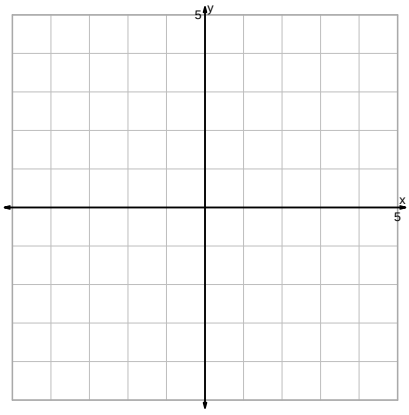
$x =$

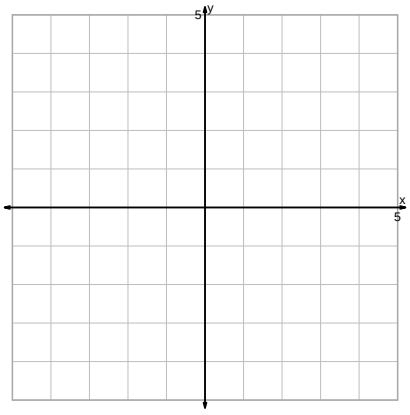
$y =$

Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

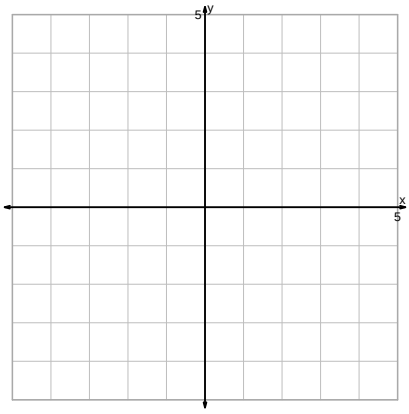
$y = 2 \cdot 2^x$

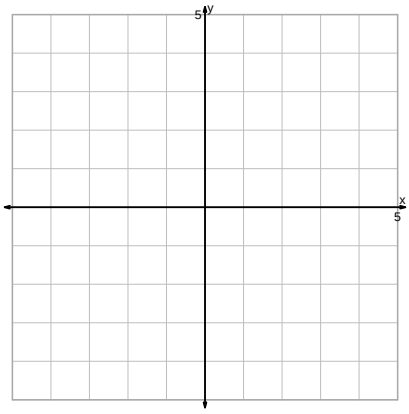




$y = \log_2(-x)$

$y = \sqrt[3]{x} - 2$

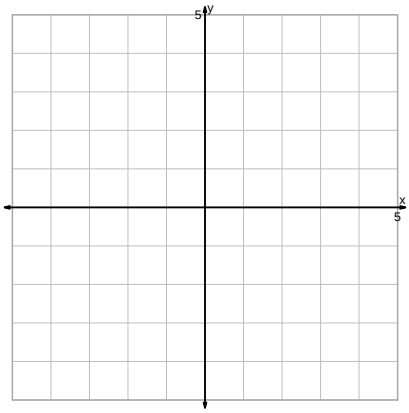


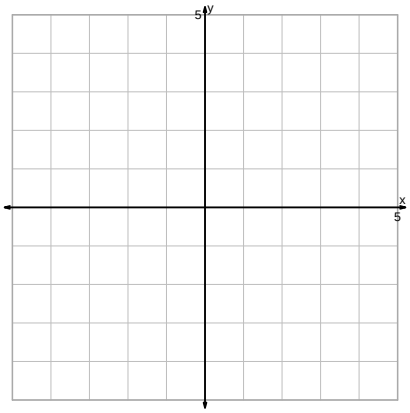


$y = \sqrt{x+2}$

Question 2 continued...

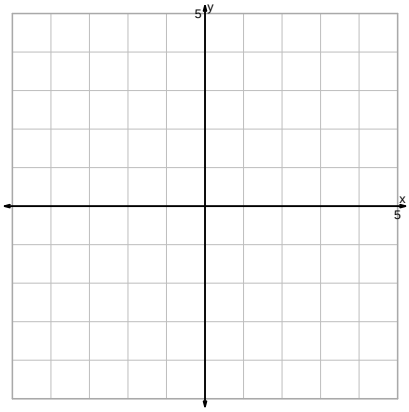
$y = x^3 + 2$

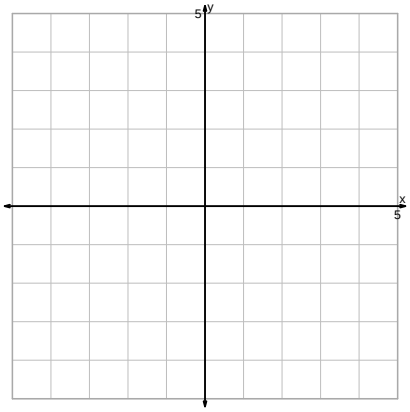




$y = \sqrt[3]{2x}$

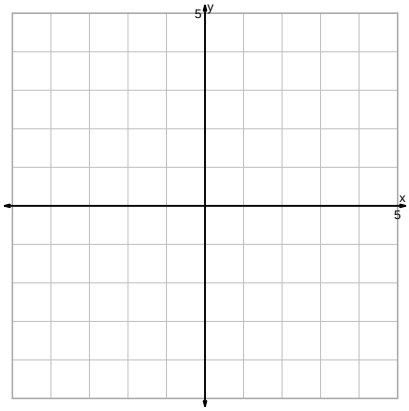
$y = -2^x$

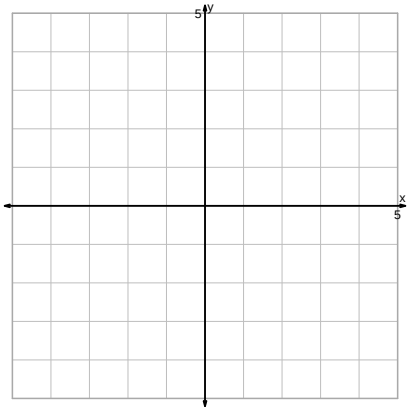




$y = \log_2\left(\frac{x}{2}\right)$

$y = (x-2)^2$

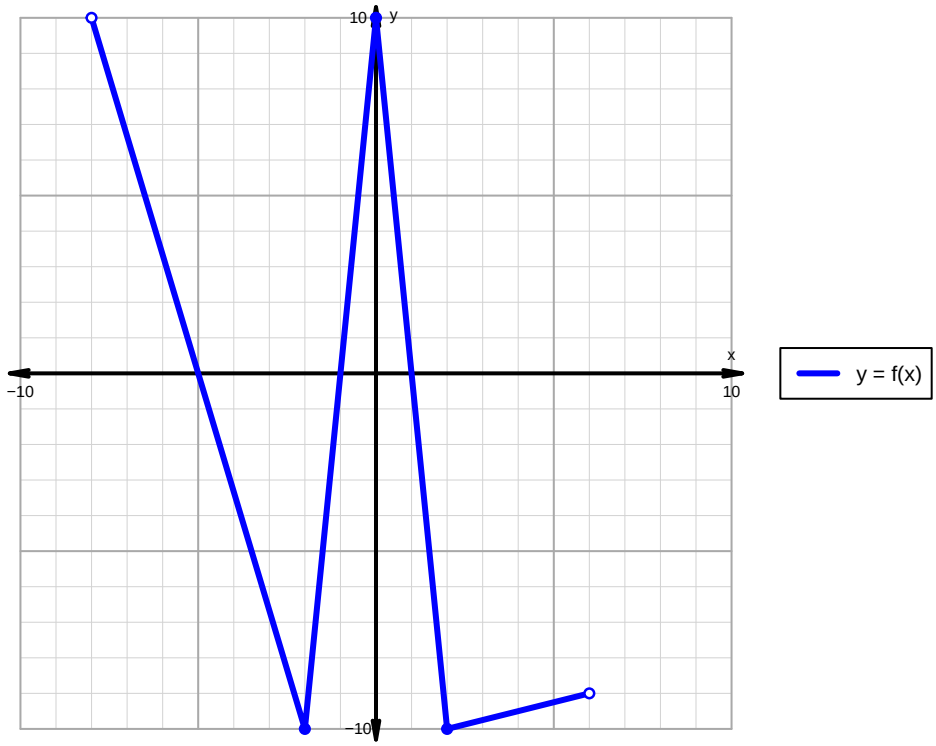




$y = \frac{x^3}{2}$

Question 3 (20 points)

A function is graphed below.



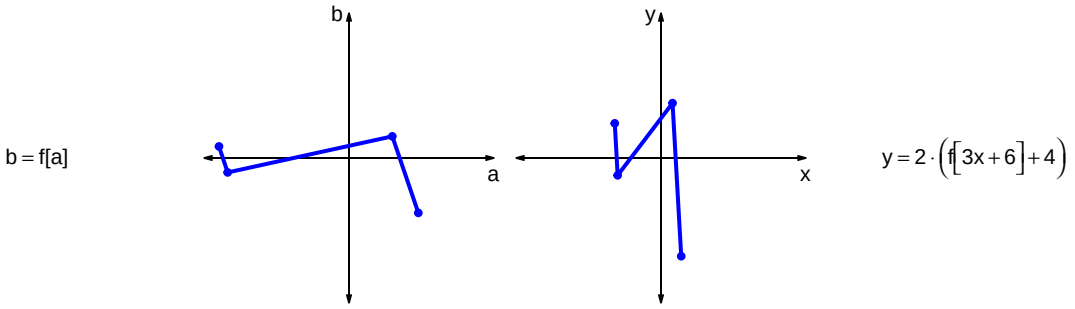
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4 (20 points)

Let f represent a function. The curves $b = f[a]$ and $y = 2 \cdot (f[3x + 6] + 4)$ are represented below in a table and on graphs.

a	b	x	y
-90	8	-32	24
-84	-10	-30	-12
30	15	8	38
48	-38	14	-68



a. Write formulas for calculating x from a and calculating y from b. (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = 2 \cdot (f[3x + 6] + 4)$?

Question 5 (10 points)

A parent square-root function is transformed in the following ways:

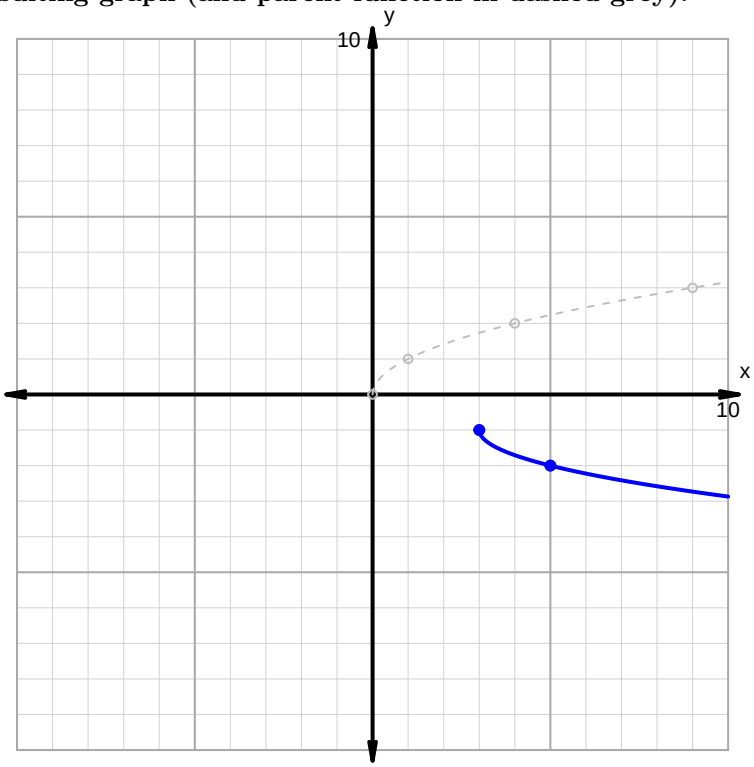
Horizontal transformations

1. Horizontal stretch by factor 2.
2. Translate right by distance 3.

Vertical transformations

1. Vertical reflection over x axis.
2. Translate down by distance 1.

Resulting graph (and parent function in dashed grey):

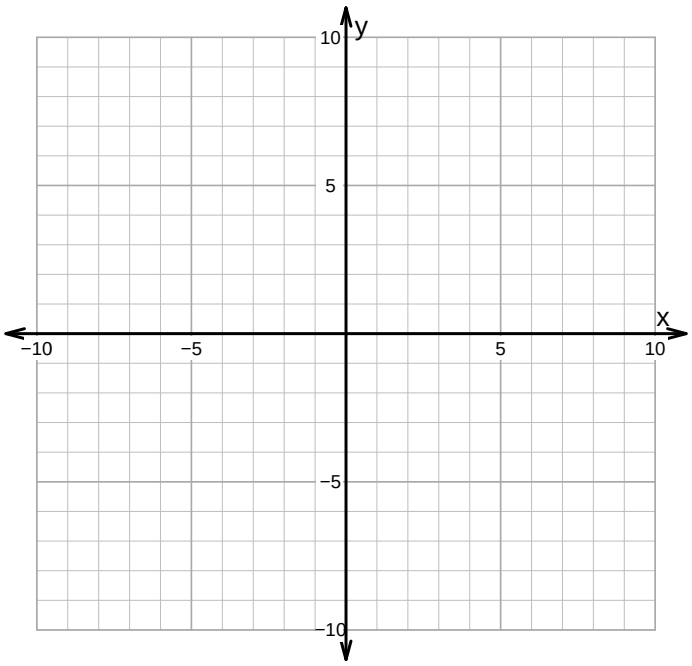


- What is the equation for the curve shown above?

Question 6 (20 points)

Make an accurate graph, and describe locations of features.

$$y \;=\; -3 \cdot |x + 8| + 3$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	